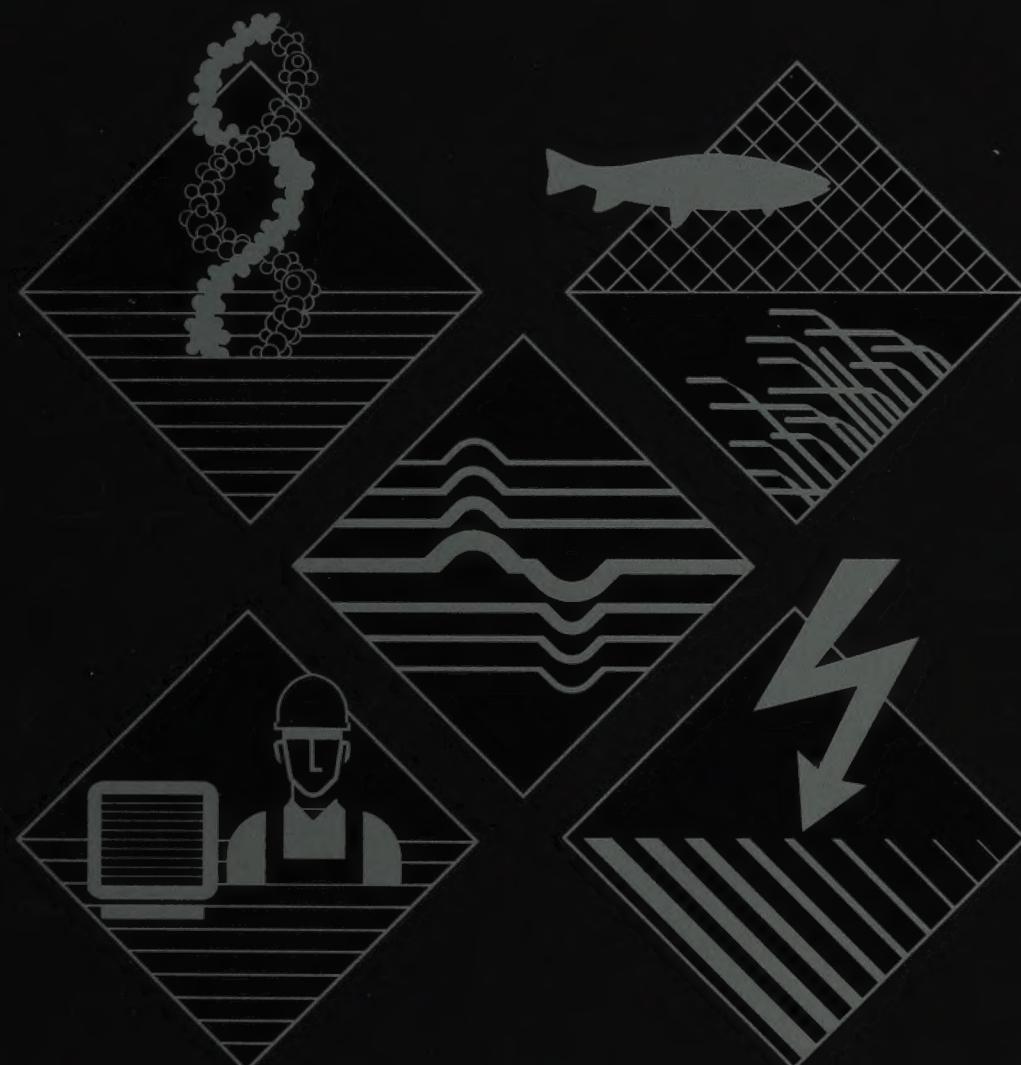
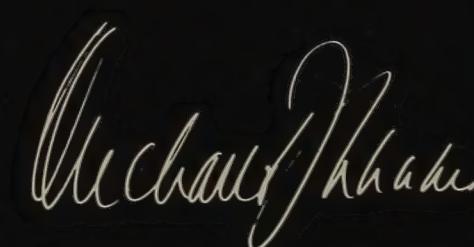


MASSACHUSETTS CENTERS OF  
EXCELLENCE



1987 ANNUAL REPORT

I am pleased to present the first annual report of the Massachusetts Centers of Excellence Corporation (MCEC). In its short history, MCEC has already become an integral part of the Commonwealth's economic strategy. The partnerships that have been created between industry and education to promote biotechnology, marine science, polymer science and photovoltaics are showing promising results. We now look to the addition of a new center in applied technology for our manufacturing industry. We are confident that by combining the powerful resources of industry, labor, academia and government Massachusetts will be well-prepared to move into the 21st century.

A handwritten signature in black ink, appearing to read "Michael S. Dukakis".

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Michael S. Dukakis  
Governor  
Commonwealth of Massachusetts

*GOVERNMENT DOCUMENTS  
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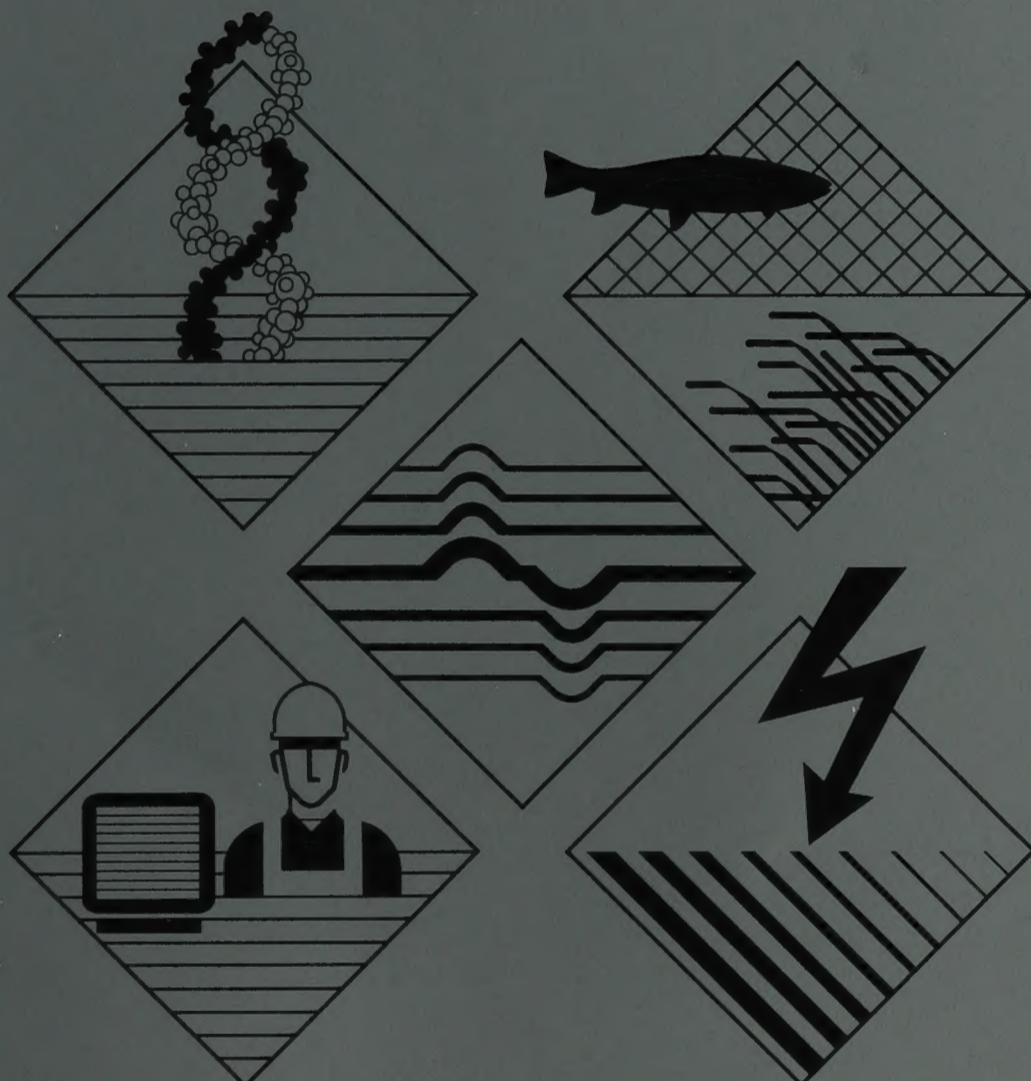
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**Massachusetts Centers  
of Excellence  
STAFF**

**Megan Jones**  
Director

**Gary Glenn**  
Deputy Director/  
Marine Science Project Director

**Fernando Quezada**  
Biotechnology Project Director

**Frances Eagle**  
Polymer Science Project Director

**Frank Emspak**  
Applied Technology Project Director

**Phoebe Kent**  
Executive Assistant

**Laurie Lee**  
Office Manager

**Carol McGuire**  
Fiscal/Administrative Assistant

It gives us great pleasure to report on the activities and accomplishments of the Massachusetts Centers of Excellence Corporation (MCEC) for the period from the signing of the enabling legislation in January 1985 through Fiscal Year 1987, the first full year of legislative funding.

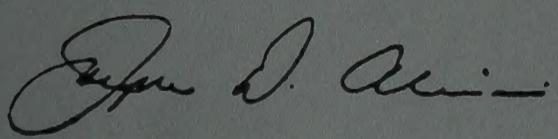
This report describes MCEC's activities in support of research, development and commercialization efforts in biotechnology, marine science and polymer science. We are also pleased to announce the approval of a new Center for Applied Technology to assist small and medium-sized manufacturing companies and the establishment of the Massachusetts Photovoltaic Center at Logan Airport.

We have completed two highly successful competitive grant rounds, soliciting proposals for joint industry/education projects that offer exceptional promise for the development of new products or processes in biotechnology, marine science and polymer science. In the first two rounds we received 292 concept papers from the newly forged partners. After extensive review by its respective technology boards, MCEC funded 41 projects. Two million dollars in MCEC grants for these projects has leveraged \$4.6 million from private industry and educational institutions.

The two-tiered system of boards has proven particularly effective in balancing concerns for technological excellence with considerations relating to commercial promise and the public well-being. The Corporation Board sets policy and makes funding decisions; the technology boards develop their strategies to carry out MCEC goals and review proposals.

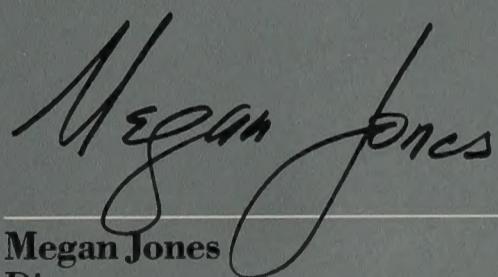
The descriptions included in this report for each of the technology areas illustrate the diversity of projects and activities supported by the Centers of Excellence, which are based on concretely focused strategies from the respective technology boards.

We are proud of MCEC's early successes and are particularly grateful to the public-spirited leaders from industry, labor, academia and government who serve on these boards.



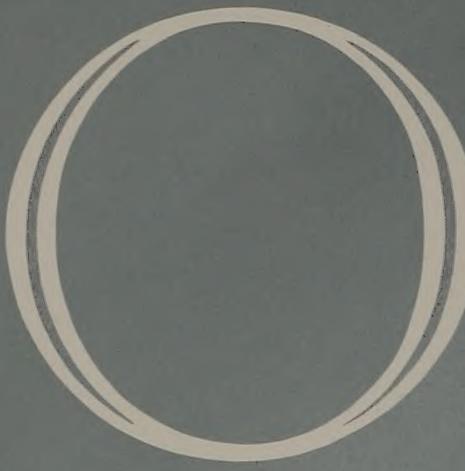
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Joseph D. Alviani  
Chairman



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Megan Jones  
Director



## Overview

The Massachusetts Centers of Excellence Corporation (MCEC) is a quasi-public agency established in 1985 to stimulate economic development by promoting new technologies and new applications of existing technologies through education/industry/government partnerships. Initially four technologies were identified—biotechnology, marine science, polymer science, photovoltaics—technologies in which Massachusetts already enjoyed an academic and/or industrial edge and which had demonstrated long-range potential for growth.

### Goals

- ◆ To aspire to the highest standards of excellence in scientific research and industrial applications in specified areas of emerging technologies that hold substantial promise for the future economic growth of the Commonwealth.
- ◆ To promote a spirit of cooperation and partnership between academic and research institutions and private industry in order to speed the transformation of scientific discovery into usable technology.
- ◆ To strengthen the teaching and research capabilities of public and private universities and research institutions as a dynamic element in regional economic development.
- ◆ To enhance and create the conditions which will advance national competitive advantage in selected advanced technology industry sectors and in academic research supportive of those sectors throughout developing regions of the Commonwealth.

**Structure** MCEC operates with a dual system of boards. Nine directors, three each from academia, private industry and government serve on the Corporation Board. Chaired by the Secretary of Economic Affairs, the MCEC Board sets policy and makes funding decisions. The technology boards, which are similarly constituted, are charged with developing specific strategies to implement the MCEC goals.

**Competitive Grants** MCEC received its first legislative appropriation of \$1.34 million for the 1987 fiscal year. Three technology boards—biotechnology, marine science, and polymer science—adopted a competitive research and development grants program which requires a partnership between educational/research institutions and one or more industries. By leveraging state resources, MCEC funded 20 projects in September, 1986 with \$1 million in state funds to which the industry-education collaborators contributed nearly \$2 million. The FY'88 budget appropriation totaled \$3.34 million which included money for the renewal of multi-year projects funded in the first round as well

as \$1 million for a second grant round. The MCEC Board voted to fund 21 new proposals in June 1987 with \$2.7 million committed by the industry/education collaborators.

The implications of these 41 projects promise to enhance crop production, the delivery of health care, manufacturing processes, the quality of the environment, among others.

### **Competitive Grant Awards**

	Round I	Round II	Total
Number of concept papers	156	136	292
Number of awards	20	21	41
Number of public/private universities and research institutions	7	12	14
Number of companies	20	27	41
MCEC dollars	\$1 million	\$1 million	\$2 million
Match dollars	\$1.9 million	\$2.7 million	\$4.6 million
Total public and private grant investment			\$6.6 million

**New Center for Applied Technology** In response to a gubernatorial request to consider a new center, the MCEC Board voted in March, 1987 to add a Center for Applied Technology (CAT) that will address the goals of MCEC by revitalizing small and medium-sized manufacturing industries through the application of new technologies. A CAT project director has been hired, and the board of directors representing labor, industry, education and government has been appointed by the Governor.

**MCEC Partnership-Building** New cooperative working relationships and departmental links between educational/research institutions are a direct result of MCEC's involvement. MCEC has also worked actively with other state agencies, particularly other quasi-publics, for the enhanced development of MCEC technologies. The Massachusetts Industrial Finance Agency (MIFA) includes MCEC technologies as one of its major criteria for funding. The Massachusetts Technology Development Corporation (MTDC) assists MCEC partners that are seeking business management assistance and venture capital. Bay State Skills Corporation (BSSC) develops training institutes, and the Massachusetts Product Development Corporation (MPDC) offers product and process development assistance.

The Centers of Excellence staff has cooperated with federal agencies and the National Governor's Association with the MCEC director serving on the NGA task force on Science and Technology. MCEC has also maintained active communications with local and national industry associations related to MCEC technologies.

**Massachusetts Photovoltaic Center** By statute the Massachusetts Photovoltaic Center of Excellence is separately funded and administered by the Executive Office of Energy Resources, and the Secretary of Energy Resources chairs the Board. In response to an industry study the Board established the Massachusetts Photovoltaic Center at Logan Airport to provide export marketing assistance. A fuller description of its activities is provided in a separate section of this report.

**Massachusetts Microelectronics Center (M<sup>2</sup>C)** In 1982 Massachusetts Technology Park Corporation (MTPC) was created as a public instrumentality to establish research and training centers in critical disciplines that require more highly skilled workers. The Massachusetts Microelectronics Center, its first center, provides equipment, facilities and technical resources in microelectronics and semi-conductor technologies.

This \$51.5 million joint venture is a partnership of industries, ten universities and state government. Located in Westboro, Massachusetts with satellite facilities at participating universities, the Microelectronics Center's design, processing and fabrication elements should be fully operational by the spring of 1988.

Although operating under separate status, the MTPC and MCEC staffs enjoy a cooperative and mutually beneficial working relationship and share a formal link through the membership of the Secretary of Economic Affairs on both the MTPC and MCEC boards.

## Home Locations of Grant Award-Winning Companies, Universities and Principal Investigators



Acton  
Amherst  
Andover  
Attleboro  
Bedford  
Belmont  
Blackstone  
Boston  
Brookline  
Buzzards Bay  
Cambridge  
Cataumet  
Clinton  
Concord  
Conway  
Dartmouth  
Deerfield  
Dover  
Duxbury

East Falmouth  
East Freetown  
East Wareham  
Falmouth  
Framingham  
Gloucester  
Harvard  
Hopkinton  
Hudson  
Hyannis  
Lawrence  
Leverett  
Lexington  
Lowell  
Lynnfield  
Marion  
Marshfield  
Medford  
Methuen

Milford  
Natick  
New Bedford  
Newton  
North Billerica  
North Dartmouth  
North Falmouth  
North Grafton  
North Uxbridge  
Northborough  
Norwell  
Norwood  
Pelham  
Pittsfield  
Pocasset  
Rochester  
Rockport  
Salem  
Sandwich

Shrewsbury  
Somerset  
Somerville  
Southbridge  
South Dartmouth  
South Deerfield  
Springfield  
Sudbury  
Sunderland  
Swampscott  
Tewksbury  
Tyngsborough  
Waltham  
Wellesley  
Westford  
Westwood  
Wilbraham  
Woods Hole  
Worcester

# B

## Biotechnology Center of Excellence

The Biotechnology Center of Excellence Board of Directors is implementing the MCEC goals through a diversified strategy which includes both a broad-based competitive grants program and specific project efforts which target currently perceived priorities for the biotechnology-related industries in Massachusetts. This strategy consists of activities within three main categories: grants for collaborative research efforts, assessment and information activities relevant to biotechnology in Massachusetts and active promotion of biotechnology development for Massachusetts.

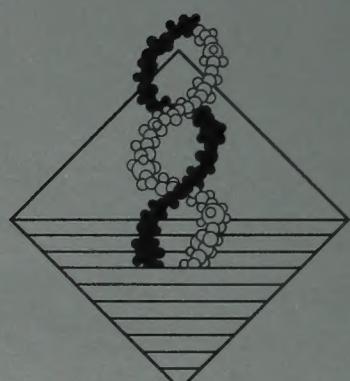
**Grants** In its grants competition program the Board invited proposals in the following areas:

- ◆ diagnostics and therapeutic drugs
- ◆ agriculture and animal health
- ◆ toxic waste degradation and treatment.

One hundred and eight concept papers in biotechnology were received during the first and second grant rounds. The eleven selected for grant awards reflect areas of significant social value and commercial importance for Massachusetts. These awards include major support for the Massachusetts Biotechnology Research Institute in Worcester.

**Information sharing** The Biotechnology Center of Excellence hosted a "Roundtable on Industrial Response to the New Federal Guidelines on the Regulation of Biotechnology," featuring representatives from the Massachusetts Biotechnology Council and officials from state agencies. The Centers of Excellence staff provided input to the Congressional Office of Technology Assessment's major report on the funding of biotechnology research in the U.S. In addition, the Biotechnology Board co-sponsored a briefing with the Massachusetts Biotechnology Council and the U.S. Department of Commerce on "International Activities in Biotechnology: Increasing U.S. Competitiveness."

**Promotion** The staff of the Biotechnology Center of Excellence and the Economic Affairs' Office of Science and Technology Director prepared two major presentations to national meetings of the Industrial Biotechnology Association, the trade association for the nation's top biotechnology firms. First was "Locational Opportunities Available to Biotechnology Firms," in New Orleans, in December 1986, and the second was "Issues, Challenges and Future Products in Biotechnology," in Los Angeles, in May 1987. The latter address has been printed in the inaugural issue of *BioPharm*, a national industry journal. The staff has also collaborated with representatives from the Massachusetts Office of International Trade and Investment (OITI) in the formulation and review of that office's plan for promotion of biotechnology firms in Japan.





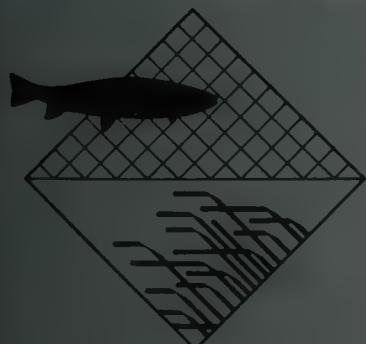
## Marine Science Center of Excellence

The initial task of the Marine Science Board of Directors was to define those areas of marine science that offer the most significant promise for economic growth. This was a complicated task, given the great diversity of marine activities in Massachusetts and the economic importance of such industries as fishing, boat building and repair, marine communications, shipping, marine recreation, food processing and environmental monitoring. After careful consideration, the board selected three areas of programmatic focus: marine electronics, marine resources and water quality. Dramatic progress has been achieved in each of these areas.

**Marine Electronics** Massachusetts has one of the world's most impressive concentrations of academic talent in marine electronics and instrumentation. Paralleling this is an array of private companies clustered in southeastern Massachusetts and on Cape Cod that are industry leaders in developing new marine applications for electronics technology. As part of the grants program, the Marine Science Board is supporting six projects in marine electronics, several of which are already showing commercial potential. The Board has taken the lead in organizing a federally funded study of international competitiveness in the marine electronics industry that will identify future markets for U.S.-manufactured instrumentation.

**Marine Resources** Increasingly sophisticated demographic projections indicate the accelerating importance of marine resources and spotlight the potential for commercial exploitation. Massachusetts contains the nation's number one fishing port and the foremost assemblage of marine biologists and oceanographers and is positioned to take advantage of these trends. The Marine Science Board selected five projects that focus on applying technological breakthroughs to economic growth in the marine resources sector. The Board has also worked on the federal level to create a national program of applied research in aquaculture and was instrumental in having Southeastern Massachusetts University designated as one of four national centers.

**Water Quality** The deterioration of Massachusetts' coastal waters has had a catastrophic effect on some marine industries and has negatively affected others, such as marine recreation. The improvement of coastal waters could have an equally dramatic effect on the economic health of fishing, aquaculture, boating and recreation. In this area the Board is supporting two projects in water quality and is working with other state and federal agencies to seek realistic solutions to water quality problems.



# Polymer Science Center of Excellence

The Polymer Science Board of Directors adopted a mission statement to establish and ensure support for state-of-the-art education and technology programs in polymer science which have been judged to hold significant economic potential for the Commonwealth.

This broad objective would primarily be accomplished by a competitive grant process that supports research and development projects at the leading-edge of polymer technology, promotes excellence in education and basic/applied research at major state universities which emphasize polymer science and technology in their curriculum, and supports the growth and innovation of ideas generated from small and medium-sized companies focused on polymer-related business.

Currently, the Polymer Science Centers of Excellence Board has identified the following areas as those of particular relevance to Massachusetts.

**Advanced materials:** the use of polymeric materials in such areas as optical, medical, electrical, composite applications; replacement of strategic materials; development of test procedures to more adequately measure critical properties.

**Polymer processing and fabrication technology:** productivity enhancement related to any aspect of the manufacturing process; computer techniques to predict mold flow; equipment modification to improve processibility; reinforcement of high stress areas to improve durability; understanding structure/processing relationships; quality control techniques to monitor polymer processing and fabrication.

**Hipolymer technology:** basic research on properties; commercial applications; modification and/or analysis of the molecular structure.

**Environmental considerations pertaining to or using polymeric materials:** recycling; waste disposal; degradation studies; source reduction considerations; construction of experimental equipment to incinerate polymers for residential or industrial use; the use of polymeric materials in waste separation technology.

Of the sixty-six high-quality concept papers received in the first two competitive grant rounds, the Board voted to recommend for funding a total of seventeen projects.

In addition, the Polymer Board has supported appropriate initiatives of state government, universities and industry that directly relate to the overall mission of the Polymer Science Board and the goals of the Massachusetts Centers of Excellence Corporation. Examples of such activities include:

- ◆ Support for the establishment of a multi-million dollar polymer science facility at the University of Massachusetts, Amherst which will enhance the University's research capacity in polymer science in order to maintain its competitive position as a world leader in polymers.
- ◆ Initiatives related to plastics recycling, including support for a pilot-scale plastics recycling project as part of the state's Bureau of Solid Waste initiative to implement recycling of household waste by 1990, cooperation with state representatives to formulate plastics recycling legislation, and hosting speakers with international knowledge of plastics recycling.
- ◆ Sponsorship of a state-wide MCEC polymer science symposium in the spring of 1988 to provide a forum for polymer initiatives within universities, private industry and state agencies.



## Center for Applied Technology

The Massachusetts Centers of Excellence Corporation approved the establishment of a Center for Applied Technology (CAT) at its March 1987 meeting. The thrust of the CAT is to transfer product and process technology through collaborative efforts among industry, labor, academia and government in order to accelerate technology development and transfer to manufacturing industries. To meet this end, the Center will provide small and medium-sized manufacturing companies with access to the kinds of technical services that heretofore only large corporations could afford.

The CAT will build upon Massachusetts' diverse manufacturing base and the rich resources of the Commonwealth's university-based manufacturing science and engineering programs. The CAT also recognizes that the skills present in the workplace are a great untapped resource. The Center's special contribution will be to bring together all parties—workers, management and academics—to implement appropriate innovative technologies.

The specific directives for the CAT will be determined by a nine member board of directors composed of representatives from academia, industry, labor and government with special expertise in manufacturing science and technology. The significant labor representation on the CAT Board reflects the importance of labor's role in addressing issues of technology application.

The strategy pursued by the CAT's Board of Directors to nurture the Commonwealth's manufacturing industries will be closely linked with the activities of the Executive Office of Economic Affairs (EOEA). Projects of the Center for Applied Technology will be coordinated with initiatives of the Massachusetts Office of Science and Technology (MOST), the Massachusetts Office of Business Development (MOBD) and the state's various quasi-public financing agencies. The CAT's contribution to and support of the existing and emerging manufacturing and engineering infrastructure in Massachusetts will add an important piece to the overall economic policy of the Commonwealth.





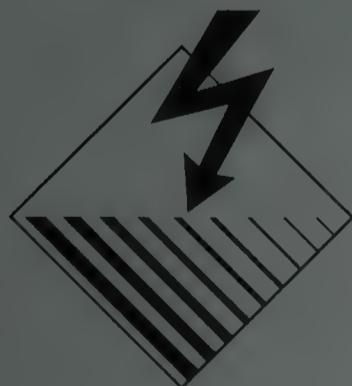
The principal focus of the Photovoltaic Center of Excellence is the Massachusetts Photovoltaic Center located at Logan Airport in Boston. It provides a host of services and programs designed to promote the use of photovoltaic technology. It is a one-stop center for purchasing, consumer and technical information about photovoltaics and its many applications.

The first of its kind in the United States, the Massachusetts Photovoltaic Center was officially opened in March, 1986. Funded by the State Energy Office, it draws on many government resources and was designed in partnership with the photovoltaic industry and academic institutions. The strength of this partnership is reflected in the demonstration, training, marketing and financing services available at the Center.

In addition, the Massachusetts Photovoltaic Center and the University of Lowell have joined resources to offer educational and technology transfer programs for international consumers of photovoltaic-powered systems. The University of Lowell is administering the evaluation program that focuses exclusively on applications-related issues which are directed at widening the knowledge base for photovoltaic stand-alone systems.

At each stage of its financial development, a photovoltaic project has unique requirements for data gathering, analysis and implementation. The Massachusetts Photovoltaic Center, under the guidance of the Center's Board of Directors, has developed information and material in the form of a case study, a general purpose financial analysis template, support documents and resource materials. This financial evaluation system is utilized by both the end-user and the financial community.

The Massachusetts Photovoltaic Center continues to play a critical role in the photovoltaic network throughout the United States. The programs and environment in Massachusetts contribute to making the state a leader in this technology.



## Grant Round I Projects

Biotechnology



Marine Science

Polymer Science

- ◆ **Massachusetts Biotechnology Research Institute Innovation Center**  
Massachusetts Biotechnology Research Institute & Worcester Business Development Corporation
- ◆ **Development of an Integrated Biological Management Program for Crown Rot of Asparagus, Using Disease-Free Clonal Plantlets Inoculated with an Avirulent Isolate of *Fusarium oxysporum***  
University of Massachusetts, Amherst & Nourse Farms, Inc.
- ◆ **Agriculture and the New Biology (film)**  
University of Massachusetts, Amherst & Monsanto
- ◆ **Pollen Biotechnology as a Method of Increasing the Cold Tolerance in the Commercial Tomato**  
University of Massachusetts, Amherst & The Bars
- ◆ **Immunoassay for Pesticides Using Novel Adjuvants for Antibody Production**  
University of Massachusetts Medical School & East Acres Biologicals
- ◆ **A Diagnostic Test for the Presence of Certain Oncogenes in Tumor Samples Using Non-Isotopically-Labelled DNA Probes**  
University of Massachusetts Medical School & Applied bioTechnology, Inc.
- ◆ **A Rapid, Sensitive Assay for Paralytic Shellfish Poison**  
Woods Hole Oceanographic Institution & Associates of Cape Cod
- ◆ **NAVSTAR/GPS—Development of Skills, Technology and Concepts for Design**  
Southeastern Massachusetts University & Datamarine International, Inc.
- ◆ **Characterization of Marine Resources Using Image Processing**  
Woods Hole Oceanographic Institution & Marine Imaging Systems, Inc.
- ◆ **Implementation of Underwater Acoustic Simulator Code**  
Southeastern Massachusetts University & Sippican, Inc.
- ◆ **Develop a Low-Cost Compact ARGOS Satellite Transmitter**  
Woods Hole Oceanographic Institution & Ferranti ORE, Inc.
- ◆ **Developing a Surimi Industry in Massachusetts**  
Southeastern Massachusetts University & Forbes and Company
- ◆ **Development of a *Vibrio parahemolyticus*-specific DNA Probe**  
University of Massachusetts, Boston & bioTechnica Diagnostics, Inc.
- ◆ **Efficiency Improvement Extension Service for Polymer Processing Industry**  
University of Lowell & Automated Assemblies, Dynisco, Inc.
- ◆ **Development of an Artificial Intelligence System for Injection Molding**  
University of Lowell & Gigamos
- ◆ **Artificial Intelligence Applied to Injection Mold Design**  
University of Massachusetts, Amherst & General Electric Plastics
- ◆ **Space Renovation for a New Polymer Science and Engineering Laboratory at**  
**University of Massachusetts, Amherst**  
University of Massachusetts, Amherst & General Electric, Monsanto
- ◆ **Massachusetts Mold Analysis Research Consortium**  
University of Lowell & General Electric, Monsanto, Digital Equipment Corporation
- ◆ **Gas Separation Membranes from Silarylene-Siloxane Polymers**  
University of Massachusetts, Amherst & Millipore Corporation
- ◆ **Magnetic Absorbents for Waste Water Treatment**  
Massachusetts Maritime Academy & Cape Cod Research

## Biotechnology



## Marine Science

## Polymer Science

### Grant Round II Projects

- ◆ **Development of a Natural Microbial Fungicide for Use in Integrated Pest Management of Cranberries**  
University of Massachusetts, Amherst & BioTechnica International, Inc.
- ◆ **Non-Chemical Control of Plant Parasitic Nematodes Through Blocking of Food-Finding Behavior**  
University of Massachusetts, Amherst & Genetics Institute
- ◆ **Development of Implantable Polymers for Controlled Release of Veterinary Vaccines**  
Massachusetts Institute of Technology & EG&G Mason Research Institute
- ◆ **Synthesis and Biological Evaluation of Novel Diagnostic and Therapeutic Drugs for Magnetic Resonance Imaging (MRI) and Nuclear Medicine**  
University of Massachusetts Medical School & Worcester Polytechnic Institute, Viomedics, Inc.
- ◆ **Use of a Direct Delivery System in the Treatment of Bovine Mastitis**  
Tufts School of Veterinary Medicine & On Site Therapeutics, Inc.
- ◆ **Development of a New Water Pollutant Analyzer Based on a Novel Trace Level Concentrator: "The Dynamic Film Concentrator"**  
Salem State College & Millipore Corporation
- ◆ **Development of High Value Products from Fish Processing Plant Wastes**  
University of Massachusetts, Amherst & Center for Applied Regional Studies, Woods Hole Oceanographic Institution, New England Fisheries Development Foundation
- ◆ **Solar Aquatic Water Purification: Nutrient and Toxic Substance Removal from Coastal Sewage Discharges**  
Ocean Arks International & Four Elements Corporation
- ◆ **A Technology for Producing Texturized Foods that Incorporate Under-utilized Fish and/or Fish Processing By-Products and Wastes**  
University of Massachusetts, Amherst & The Gorton Group, Food Engineering Laboratory, U.S. Army Natick RD&E Center, Werner & Pfleiderer Corp.
- ◆ **High Data Rate Underwater Acoustic Telemetry Link**  
Southeastern Massachusetts University & Datasomics, Inc.
- ◆ **A Low-Cost Intelligent Autonomous Underwater Vehicle**  
Massachusetts Institute of Technology & Sippican, Inc.
- ◆ **Resource Facility for Increasing the Service Life of Critical Parts in Plastics Processing Machinery by Plasma Nitriding**  
Northeastern University & GE Plastics Group, Packaging Industries, Composite Container Corporation
- ◆ **Demonstration of Sub-Micron Fiber Containing Composites**  
University of Lowell & Hyperion Catalysis
- ◆ **Optical and Engineering Properties of Molecular Composites Comprising Liquid Crystal and Vinyl Polymers**  
University of Massachusetts, Amherst & Polaroid
- ◆ **Metal Oxide Ceramics from Organometallic Polymers and Copolymers**  
University of Massachusetts, Amherst & Norton Company
- ◆ **Defective Part Prediction for Injection Molding**  
University of Lowell & Scientific Systems, Nypro, Dynisco
- ◆ **Computer-Aided Project Design for Economical Manufacture**  
University of Massachusetts, Amherst & Digital Equipment Corporation, Xerox Corporation
- ◆ **Fiber Optic Switching Using Polymer Nonlinear Optic Materials**  
University of Lowell & Foster-Miller
- ◆ **Novel Polysilanes for Photolithographic Applications**  
University of Lowell & Digital Equipment Corporation
- ◆ **Evaluation, Optimization and Implementation of Polymer Recycling Technologies In the Commonwealth of Massachusetts**  
University of Lowell & New England CRinc
- ◆ **A New Approach to Injection Molding**  
University of Massachusetts, Amherst & Monsanto, Polaroid

**Financial Statement**

**Massachusetts  
Centers of Excellence  
Corporation  
Balance Sheet,  
June 30, 1987**

<b>Assets</b>	<b>General Support:</b>	
	Cash and equivalents .....	\$ 58,054
	Prepaid expenses and other .....	6,569
	Total general support .....	64,623
	Restricted for Grants—Cash and equivalents .....	781,377
	Total Assets .....	\$846,000
<b>Liabilities and Fund Balances</b>	<b>General Support:</b>	
	Accrued liabilities .....	\$ 10,417
	Fund balance .....	54,206
	Total general support .....	64,623
	Restricted for Grants—Committed Fund balance .....	781,377*
	Total Liabilities and Fund Balances .....	\$846,000
<b>Statement of Revenues, Expenditures, and Changes in Fund Balances for the Year Ended June 30, 1987</b>	<b>General Support</b>	<b>Restricted Funds</b>
<b>Revenues:</b>	<b>Appropriation—</b> Commonwealth of Massachusetts ....	
	\$344,755	\$1,300,000
	Interest earned .....	43,685
	Total revenues .....	388,400
<b>Expenditures:</b>	Grant support .....	334,234
	Grant payments .....	518,623
	Total expenditures .....	334,234
		518,623
Excess of Revenues Over Expenditures .....	\$ 54,206	781,377*
Fund Balances, Beginning of Year .....	-0-	-0-
Fund Balances, End of Year .....	\$ 54,206	\$ 781,377*

\* Committed Grant Funds

The Massachusetts Centers of Excellence Corporation is audited annually by Deloitte Haskins + Sells.

## MCEC

### Board of Directors

**Joseph D. Alviani**  
Secretary  
Executive Office of  
Economic Affairs

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President  
Sippican, Inc.

**Joan Bok**  
Chairman of the Board  
New England Electric System

**Paul P. Brountas, Esq.**  
Senior Partner  
Hale & Dorr

**Joseph Duffey**  
Chancellor  
University of Massachusetts,  
Amherst

**James S. Hoyte**  
Secretary  
Executive Office of  
Environmental Affairs

**Sharon M. Pollard**  
Secretary  
Executive Office of  
Energy Resources

**David Saxon**  
Chairman  
Massachusetts Institute of  
Technology Corporation

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Whitehead Institute

**Joseph Carter**  
Chairman of the Board  
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University of Massachusetts  
Medical Center

**The Honorable  
Joseph D. Early**  
U.S. House of Representatives

**Deborah Prothrow-Stith**  
Commissioner  
Department of Public Health

**Carol Reinisch**, Chair  
Department of  
Comparative Medicine  
Tufts University School of  
Veterinary Medicine

**Gabriel Schmergel**  
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**August Schumacher**  
Commissioner  
Department of Food  
and Agriculture

**Nigel Webb**  
President  
Weston Biotechnology Group

### Marine Science Board of Directors

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Massachusetts Maritime  
Academy

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